

CLAIMS:

1. A low-pass filter comprising a large and a small capacitor which are connected in parallel, the large capacitor being connected in series with a resistor, characterized in that the filter is embodied on the basis of a semiconductor substrate with a first surface, in which the small and the large capacitor are provided as vertical trench capacitors, the trenches extending to the first surface on which the resistor is provided.
2. A low-pass filter as claimed in claim 1, characterized in that the semiconductor substrate further comprises a drift compensation part.
- 10 3. A low-pass filter as claimed in claim 1, characterized in that one end of the filter is connected to ground.
4. A low-pass filter as claimed in claim 1, characterized in that the small and the large capacitor are separated by a high-ohmic substrate zone with a resistance of at least 0.5
15 $k\Omega/cm$.
5. A low-pass filter as claimed in claim 1, characterized in that the trench capacitors have a dielectric comprising silicon nitride.
- 20 6. A low-pass filter as claimed in claim 1, characterized in that the resistor comprises a layer of polysilicon, in which layer the upper electrodes of the capacitors are defined as well.
7. A low-pass filter as claimed in claim 1, characterized in that the
25 semiconductor substrate further comprises diodes
8. An electronic device provided with a phase locked loop function comprising a comparator, a low-pass filter and a voltage controlled oscillator, the comparator and the oscillator being part of a single semiconductor device and the low-pass filter being embodied

by a small and a large capacitor, characterized in that the low-pass filter according to any one of the claims 1 to 7 is present, which filter is assembled to the semiconductor device in a stacked die construction.

5 9. An electronic device as claimed in claim 8, wherein the semiconductor device is provided with a first and an opposed second side, at which first side the low-pass filter is present and at which second side the semiconductor device can be coupled to a heat sink.

10 10. An electronic device as claimed in claim 8 or 9, characterized in that the low-pass filter has lateral dimensions which are at most equal to those of the semiconductor device.

11. An electronic device as claimed in claim 8, wherein the phase locked loop is provided in an open loop architecture.